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Article

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Does gender discrimination exist in the promotion of CPAs? - Evidence based on the CPA firm transformation

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ABSTRACT

In this paper, we examine the gender discrimination issue in the promotion process of CPAs under the background of CPA firms' organizational transformation in China. We find that there are significant gender differences when CPAs are promoted to the partner position. We further explore whether the economic contribution of a CPA, his/her audit quality, and the psychological difference among different genders could explain the above gender differences. However, we did not find any supporting evidence. We even find that the female candidates provide significantly higher audit quality than their male competitors in the promotion year. Our empirical evidence indicates that females face higher promotion standards than male CPAs when they are promoted to the partner position. There is significant gender discrimination during the promotion process in CPA firms. Our paper contributes to the study of CPA promotion mechanism, and provides empirical evidence on the gender discrimination in promotion.

KEYWORDS

CPAs; promotion; gender discrimination; CPA firm organisational transformation

1. Introduction

There is an important phenomenon that the percentage of females is significantly lower than males among top executives. Such phenomenon is more common in China. For example, in the natural science field, there are only 6% of female academicians in the Chinese Academy of Sciences, and only 4.95% of female academicians in the Chinese Academy of Engineering, by the end of December 2017. In the political area, after the 2018 re-elections, 106 women were elected as leading cadres at or above the vice-provincial level, which is 13.04% of the total 813 cadres. In the field of economic management, based on the *Gender Diversity of Board Members: A Global Perspective* issued by Deloitte in June 2017, there are only 5.4% of female chairmen among the A-share listed companies in 2016. Is there any similar gender difference among CPAs during their promotion process? If so, how large could the impacts of gender discrimination be? Such questions have attracted the attention from regulators, industry policy makers, and audit researchers.

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There are three major reasons why we focus on the CPAs' career promotion and gender discrimination. First, with the Reform and Opening and the construction of socialist market economic system, the CPA industry in China got restoration and further development. It becomes an important link in the integrity chain of the market economy and a social monitoring force that maintains the economic order and protects the interests of all parties. By 30 June 2019, the Chinese Institute of Certified Public Accountants (CICPA) has 9,118 member firms (CPA firms), among which 40 members are qualified for operating security and future related business, and 11 local firms are eligible to audit H-share companies. So far, there are over 260,000 CPAs across the country and almost 400,000 employees in the industry. The CPA industry serves about 4.2 million companies and administration organisations, including over 3,000 public companies. In addition, the continuous development of the CPA industry is an important power to improve the socialist market economic system and maintain the economic order. It is also the requirement to implement the major strategies of the CPC Central Committee and the State Council. Since the 18th CPC National Congress, the State Council has requested higher standards on the service role of the CPA industry in their official files regarding strengthening the capital market construction and the audit work, developing the service trade, enhancing new advantages in foreign trading, promoting entrepreneurship and innovation, deepening the reform of state-owned enterprises, and speeding the construction of free-trade zones, etc. Due to the importance of the CPA industry and the urgency of its continuous development, it's necessary to examine the promotion process in the CPA industry, which is also an important factor for the healthy development of the industry.

Second, based on the information from the CICPA website, there were 29,567 CPAs with security qualifications by the end of June 2019. Among them, 15,902 are female CPAs, which cover 53.78%. Over half of the CPAs are female. The study of Wang et al. (2019) also finds that there are more female students than male among the accounting majors in colleges and universities. Based on their survey on some colleges in Hubei province, there are 78.77% of female students in the freshman of accounting major students in 2017 at Zhongnan University of Economics and Law (ZUEL), which indicates a ratio of 1 to 4 for male vs. female students, while the ratio is close to 1:5 for accounting major students in Huazhong University of Science and Technology and about 1:3.5 in China University of Geosciences (Wuhan). They further document that the percentage of female students in accounting freshmen has been increasing at ZUEL from 2005 to 2016. The percentage of female accounting students is much higher the male students in the colleges and universities. And such difference is increasing. All these indicate that the percentage of female CPAs will further increase in the future and the role of female CPAs will become more important. Therefore, it's important to investigate the career promotion of CPAs, which can promote the role of female CPAs and the development of the industry.

At last, the CPA industry has its unique characteristics. First, there are significant economic consequences of the professional opinions issued by the CPAs, which can cause huge losses of investors. Second, the CPA industry has strong demands for professionals who can make complicated professional judgements based on their knowledge and experience during their work. Third, unlike practitioners in other industries, it's hard to directly observe the quality of CPAs' work. Such unique industry characteristics also motivate us to examine the promotion of females in the CPA industry.

The CPA firms' organisational transformation in China provides us a good opportunity to examine the above research questions. In July 2010, the Ministry of Finance and the State Administration of Taxation in China issued the *Interim Provisions on Promoting the Organizational Form of Special General Partnerships for Large and Medium-Sized Accounting Firms* (hereafter, the Provision). The Provision requires the large and medium-sized accounting firms to change their organisational form from limited liability companies to the special general partnerships. After such transformation, a CPA firm needs to recruit its partners and the names of those partners and the time when they got promoted can be found from the Bureau of Industry and Commerce. Thus, we investigate the gender discrimination issue during the CPA promotion process under the background of CPA firm transformation.

We use 4,844 partner candidates during the period of 2012 to 2018 as our sample. The study shows that on average, the probability of female CPAs being promoted to partners is 73.24% lower than the probability of male CPAs. In addition, we find that CPAs with longer working experience, younger ages, higher education level, better graduation schools, non-accounting major, and Big 4 experience, and CPAs who are heads of firm branches, moved to larger cities, and have more contributions to the firm, are more likely to become partners during the promotion. However, after controlling these human resource factors, organisational factors, behavioural factors, as well as the economic contributions and audit quality, the promotion probability of female CPAs is still significantly lower than that of male CPAs. In a further analysis, we compare the audit quality between the female candidates and the male candidates in the year of their promotion. The results show that in the year of promotion, the audit quality of female candidates is significantly higher. The above findings indicate that there is gender difference during the promotion of CPAs, and such difference cannot be explained by their human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, audit quality and psychological differences. Therefore, the gender discrimination becomes a possible explanatory factor. We also match CPAs who got promoted with CPAs who didn't to obtain a matched sample using the PSM method. The results of the matched sample also indicate lower promotion probability of female CPAs.

There are two major contributions of this paper. First, the study of female CPAs' promotion issue adds to the research on the internal governance in CPA firms. Wang (2006) points out that, strengthening the construction of the internal governance mechanism of accounting firms is an important guarantee for improving the quality of accounting information and the CPAs' audit quality. It's also an important way to promote the stability of the capital market, maintain the public interests, and implement the international development strategy of the accounting industry. However, there is rare research on the CPA firms' internal governance in the current literature. A few studies discuss the theory and principles of the internal governance in CPA firms (Wu & Chen, 2012), firms' decision-making power allocation (Li, 2011; Lennox et al., 2020), and the profit allocation mechanism (Tan, 2006; Yu & Chen, 2002). To our knowledge, we don't find any study on the promotion mechanism of partners in CPA firms. Due to the 'Ren He' nature of the CPA firms, the promotion of partners plays an important role in its internal governance. Our study can help to understand and improve such governance mechanism.

Second, we further extend the study on individual auditors' characteristics by examining the promotion of female CPAs. There is extant empirical research on individual

auditors' personal characteristics (Chen, Peng, et al., 2016; Guan et al., 2016; He et al., 2017; Lennox et al., 2014; Laurion et al., 2017; Li et al., 2017; Wang et al., 2016). However, few studies focus on the gender difference of auditors. Among them, most studies discuss the impacts of the gender differences in psychological characteristics on audit behaviour. For example, Gold et al. (2009) find that the gender difference could impact the audit judgements; Hardies et al. (2015) find that public companies pay higher audit fees to female auditors using a sample of Belgian listed companies from 2008 to 2011; Ittonen et al. (2013) and Hardies et al. (2016) show that, female auditors can better constrain earnings management and provide higher audit quality. Related studies in China also focus on the differences in psychological characteristics and their impacts on accounting robustness and moral judgements (Chen, Zhang, et al., 2016; Fu, 2014; Luo et al., 2014). Lennox and Wu (2018) indicate that it's an important direction in future research to examine the gender discrimination issue in female auditors' promotion process. It is also a hot topic nowadays since audit firms face claims of gender discrimination. For example, in the Class Action of Kassman et al. vs. KPMG LLP, the plaintiffs claim a compensation of \$350 million dollars due to gender discrimination. Our study can help to evaluate the generalisation of such claims. In addition, there may be an issue to consider the impacts of gender differences in psychological characteristics on CPAs' audit behaviour, without considering the promotion mechanism. Such impacts may be caused by the promotion difference, instead of the psychological characteristics. Our research on the front-end promotion of female auditors is beneficial to expand and deepen the research on the behaviour of back-end female auditors.

The rest of the studies proceed as follows: [Section 2](#) reviews the literature and develops our hypotheses. [Section 3](#) describes the sampling procedure. [Section 4](#) discusses the empirical models. [Section 5](#) provides the empirical results and the robustness tests. [Section 6](#) presents further discussions. [Section 7](#) summarises and concludes the study.

1.1. Literature review and hypotheses development

A reasonable promotion mechanism can not only impact the career development of an individual, but also have significant influences on the organisational performance (Lu, He, et al., 2016; Liu et al., 2017; Zhang & Zhang, 2017). The current literature has an extensive discussion on the gender difference in employee payments (e.g. Li et al., 2014; Sun, 2017). We further analyse the gender difference in partner promotion under the background of CPA firm transformation.

What are the factors that determine the gender difference in promotion? Is gender discrimination an important factor to explain such difference? Researchers in China and other countries have conducted extensive discussions on these. According to the human capital theory, due to the expected lower rate of return on human capital investment, the education and training levels of females are lower than males, which leads to fewer promotion opportunities for women. The difference of the return on investment can be caused by the biological differences among genders, or the differences of their social roles (Becker, 1985). For example, women take more responsibility for the childcare and housework, which leads to less effort spent on their work and lower performance. However, later studies find that, even after controlling the performance level, gender still has a significant impact on career promotion.

The human capital theory cannot explain the gender difference during the promotion process. Another possible explanatory factor could be the gender discrimination. Cabral et al. (1981) investigate three fiduciary institutions and find that, women's entry job level and their promotion probability are lower than men, even if with the comparable qualifications. Winter-Ebmer and Zweimuller (1997) use a sample of white-collar workers in Australia and document that women face higher promotion standards than men. Neither the different productive characteristics nor the non-labour market factors can explain such gender differences in promotion. Ginther and Hayes (2003) investigate the academia field by using a sample of people with doctoral degrees. They find that the gender discrimination is an important reason for lower promotion probability of females. In China, Yan (2008) document gender discrimination in promotion during the development of human resources in corporations. Qing (2011) also examines the gender differences in promotion and the discrimination issue by using the national sample data (CGSS2006). He finds that, about half of the gender differences in promotion cannot be explained by observable factors such as education level and working experience. Neither other potential explanatory factors can, except gender discrimination.

How does gender discrimination in job promotion arise? There are two theoretical explanations: The statistical theory of racism and sexism and the preference theory of discrimination. The statistical theory was proposed by Phelps (1972). In the statistical theory, the typical characteristics of a group are treated as the common characteristics that each individual member has, and such typical characteristics are used as the standards for employment and promotion. The theory argues that the employers want to hire and promote the employee with the highest productive performance per labour cost. However, since the ability of an individual worker cannot be observed directly, the employers need to estimate an individual member's ability based on the statistical characteristics of the group. If the female group exhibits lower overall performance than the male group, the employers tend to hire and promote male workers to maximise their profits, although it is inaccurate to simply use the female group's characteristics as each individual's. Bjerk (2008) tests such statistical discrimination in a dynamic model of hiring and promotion and finds that the statistical discrimination during promotion is an important reason for the under-representation of females at the high job levels in an occupation.

The preference theory of discrimination was proposed by Baldwin et al. (2001) and Becker (1985). The theory argues that the lower promotion probability of females is caused by the reluctance of men to work under female managers or their biases against women supervisors. Male workers develop distastes for female management. Females cannot be promoted until such distastes are compensated. Hence, there is a discrimination cost for female promotion. Only a few females with higher ability can be promoted. There is also a positive correlation between such discrimination cost of females and the number of men supervised, the wage rate, and the strength of male distastes for female supervision. A higher level of position also leads to higher discrimination costs and it's more difficult for females to promote. Eagly and Karau (2002) also find that the conflicts between women's management roles and their social roles could cause discrimination for female managers and constrain their promotion.

Is there any gender difference in CPAs' promotion? If so, is such difference caused by the CPAs' human capital characteristics, the organisational characteristics, their

behavioural characteristics, economic contribution, audit quality, or psychological differences? Is the gender discrimination one of the major factors? We will test these questions in the following empirical analyses.

2. Sample selection

During the period of 2011 to 2013, the CPA firms with security qualifications in China gradually changed their organisational forms from limited liability companies (LLC) to the special general partnerships. By searching their business registration information, we obtained the partner information in these firms in each year after such transformation. Since the partners being promoted in the first year include the shareholders under the original LLC, we start our study using the second year after the transformation. By comparing to the partner list of prior year, we can identify the newly promoted partners in the current year. By using these newly promoted partners, we examine whether female auditors face gender discrimination during the promotion process. Based on the CPA firms' business registration information between 2011 and 2018, 2,199 newly promoted partners with CPA licences are identified for the sample period of 2012 to 2018.

In general, a CPA cannot be promoted directly from an auditor to a partner in a CPA firm. He/she usually needs to become a senior manager before being a partner candidate. However, we cannot find the individual information in the CICPA website for 302 out of the 2,199 partners we identified above. For the remaining 1,897 partners with individual information, the position information of 878 partners indicates 'N/A' on the CICPA website, which is about 46.28%, and the position of 402 partners is shown as CPA, assistant, assistant manager, assistant auditor, staff, auditor, employee, in position, general manager, general staff, business assistant, auditing assistant, project assistant, intermediate auditor, senior auditor, first-level manager, intermediate project manager, business manager, manager, project leader, etc., which covers 21.19%. Based on such information, it seems that the position information on the CICPA websites is not accurate nor updated on time. Thus, we cannot use the position information there. This is also one of the reasons to use the business registration information. Similar issues exist for the position information of non-partners on the CICPA website.

Therefore, to identify the partner candidates, we rely on the working experience of an CPA. Through our discussion with partners in the Big 4 CPA firms and other local firms, we obtain a general promotion process of a CPA: starting as a junior auditor, a CPA usually gets promoted to be a senior auditor after 2–3 years, then to be an audit manager after another 2–3 years and a senior manager for additional 2–3 years. In general, a CPA gets a small promotion in each year and a big promotion every three years till he/she becomes a senior manager. Such promotion process lasts for 6–9 years and receives more assurance. This indicates that a CPA will become a partner candidate when he/she becomes a senior manager after about 9 years. Also, the faster the CPAs get their licence, the shorter time they need to become a senior manager. To be conservative, we use 8 years after obtaining the CPA licence as our benchmark to identify senior managers who can be partner candidates. In order to get a CPA licence, an auditor needs to pass the CPA exams first and then obtain at least two-year working experience. This brings the total working experience to 10 years after passing the CPA exams. Individuals with such experience are more likely to be senior managers. Based on such standards, we obtain 35,329 partner

candidates during the sample period of 2012 to 2018. Combined with the above 2,199 newly promoted partners, the initial sample includes 1,539 auditors who are newly promoted partners, and 33,790 auditors who are not promoted. After deleting observations with missing information in our research models, we get 21,046 partner candidates as our sample for both signing auditors and non-signing auditors. Further, we exclude non-signing auditors and those with missing variable information, which leaves 4,844 partner candidates who are all signing auditors in our final sample. Among them, 498 are newly promoted partners, and 4,346 are partner candidates.

For those who actually got promoted but don't meet our above requirements as senior managers, we identify them as auditors with exceptional promotion process and exclude them from our research sample. However, we add them back to the sample in the later robustness tests and the empirical results remain the same.

3. Research design

The nature of gender discrimination in CPA promotion is that there are gender differences in promotion standards regarding an auditor's ability, where females CPAs face higher standards for their ability levels than males. This can lead to lower promotion probability of female CPAs than male CPAs, with the same ability level. In Model 1, we examine the determinants of CPAs' probability of being promoted as a partner, as well as the existence of gender discrimination.

$$\begin{aligned}
 PARTNER = & \beta_0 + \beta_1 GENDER + \beta_2 WORK_YEAR + \beta_3 AGE_YEAR + \beta_4 EDUCATION \\
 & + \beta_5 SCHOOL + \beta_6 PARTY + \beta_7 MAJOR_ACCOUNTING \\
 & + \beta_8 MAJOR_MANAGEMENT + \beta_9 MAJOR_ECONOMIC \\
 & + \beta_{10} OFFICE_CHARGE + \beta_{11} BIG4 + \beta_{12} FLOW_SO + \beta_{13} FLOW_ON \\
 & + \beta_{14} ACC_LNASSET + \beta_{15} RANK + \beta_{16} DA_AVERAGE \\
 & + \beta_{17} OPINION_RATIO + FE_{YEAR} + FE_{AUDIT_FIRM} + \varepsilon
 \end{aligned} \tag{1}$$

In Model 1, *PARTNER* is the dependent variable, which takes the value of one if a CPA got promoted as a partner in a year, and zero otherwise. *GENDER* is the test variable in the model, which equals to 1 for female CPAs, and 0 otherwise. If there is gender discrimination during the promotion process in CPA firms, we expect a negative coefficient of *GENDER*. We also control for an CPA's human capital characteristics, the organisational characteristics, the behaviour characteristics, the economic contribution, and the auditor quality in Model 1.

In the above model, *WORK_YEAR*, *AGE_YEAR*, *EDUCATION*, *SCHOOL*, *PARTY*, *MAJOR_ACCOUNTING*, *MAJOR_MANAGEMENT*, *MAJOR_ECONOMIC*, and *OFFICE_CHARGE* are control variables for human capital characteristics. *WORK_YEAR* is the natural logarithm of the number of years a CPA has worked for. A longer working experience indicates more expertise and higher eligibility of being a partner. We expect its coefficient to be positive. *AGE_YEAR* is the natural logarithm of a CPA's age. A younger CPA has age advantages during the promotion process. We expect a negative coefficient of *AGE_YEAR*. *EDUCATION* indicates the education level of a CPA, which takes a value of 3 for a master's degree, 2 for a bachelor's degree, and 1 for a college degree or below. *SCHOOL* represents the level of a CPA's graduation school, which equals to 3 for the 985

universities, Chinese Academy of Sciences, Chinese Academy of Social Sciences, and top 200 non-mainland China universities in the 2017 QS World University Ranking, 2 for the 211 universities and Top 201–500 non-mainland China universities in the 2017 QS World University Ranking, and 1 otherwise. A higher education level and a better graduate school indicate better human capital of a CPA and such individual is more likely to be promoted. Thus, we expect positive coefficients of *EDUCATION* and *SCHOOL*.

PARTY is a dummy variable that equals to 1 for CPC members, and 0 otherwise. The CPC membership is a similar certificate as an education diploma. It is a signal for representation ability and other unobservable characteristics (Liu & Wang, 2010). In addition, the CPC membership can serve as an informal individual information network, and effectively expand personal social networks (Cheng & Shi, 2016; Dickson, 2014; Lu, Wang, et al., 2016). Therefore, the party membership can increase the promotion probability and we expect a positive coefficient. Three dummy variables are also included in the model to control for the impacts of different majors, *MAJOR_ACCOUNTING*, *MAJOR_MANAGEMENT*, and *MAJOR_ECONOMIC*. *MAJOR_ACCOUNTING* takes the value of one if a CPA is an accounting major, and zero otherwise. *MAJOR_MANAGEMENT* takes the value of one if a CPA is a non-accounting business major, and zero otherwise. *MAJOR_ECONOMIC* equals to one if a CPA is an economic major, and zero otherwise. Since how the major impacts CPAs' promotion is less clear, we do not have expectations on the signs of their coefficients. *OFFICE_CHARGE* is a dummy variable that equals to 1 if a CPA is also the person in charge of an audit office, and 0 otherwise. We expect the person in charge has higher promotion probability and thus a positive coefficient of *OFFICE_CHARGE*. *BIG4* is dummy variable that equals to 1 for Big 4 auditors, and 0 otherwise. It controls for the organisation characteristic of the firm and we don't expect the sign of its coefficient.

FLOW_SO indicates the city level difference between the city of a CPA's initial audit firm and the city where a CPA's school locates. *FLOW_ON* indicates the city level difference between the city of a CPA's current audit firm and the city of a CPA's initial audit firm. According to the 2018 China City Business Charm Ranking List released by China Business Network, Chinese cities are divided into six different levels. We give the value of 6 to 1 for cities at Level 1 to Level 6, respectively. The larger the value of *FLOW_SO*, the better of the city where a CPA started his/her career than the school city. The larger the value of *FLOW_ON*, the better the city of the current audit firm than the city of the initial audit firm. The two variables control for a CPA's behavioural characteristics and we don't have expectations for their coefficient signs.

ACC_LNASSET is the sum of the natural log of an auditor's clients' assets. *RANK* represents the percentage of audit reports where a CPA is the first signing auditor out of all his/her signing reports. Both variables are used to measure the economic contribution of an auditor to his/her firm. The larger values indicate more economic contribution of the auditor and he/she is more likely to be promoted. Thus, both coefficients are expected to be positive. *DA_AVERAGE* is the average of the absolute values of all clients' discretionary accruals of an auditor, where the discretionary accruals are calculated by the Modified Jones Model by industry and year. The industry classification is based on the *Guidelines on Industry Classification of Listed Companies* issued by the China Securities Regulatory Commission (CSRC) in 2012. The Sub-category is used for the manufacturing industry, while the Category for other industries. *DA_AVERAGE* controls for the audit quality of a CPA. *OPINION_RATIO* is calculated as one minus the percentage of unqualified

opinions, which also controls for a CPA's audit quality. The higher a CPA's audit quality, the higher the likelihood of being promoted. Thus, the coefficient of *DA_AVERAGE* is expected to be negative and the coefficient of *OPINION_RATIO* is expected to be positive. Since the sample period covers 2011 to 2018, we also include year dummy variables in the model to control for the time fixed effects (*FE_YEAR*). The audit firm fixed effects (*FE_AUDIT_FIRM*) are also considered in the model. If there is gender discrimination during the CPAs' promotion process, we expect a significant and negative coefficient of *GENDER* even after controlling all the above human capital characteristics, organisational characteristics, behavioural characteristics, the economic contribution, and audit quality.

In this paper, we only focus on the partner promotion, instead of other positions. There are two main reasons. First, among all the position promotions, the partner promotion is the most important one. Partners represent the core competency of a CPA firm and their ability and quality determine the practice quality and efficiency of the firm. Therefore, the partner promotion is vital for a CPA firm. Moreover, the promotion from a non-partner to a partner position indicates a qualitative improvement of an auditor's status. He/she changes from an 'employee' to an 'owner', which gives him/her the right to claim residual incomes of the firm. The partner promotion is also a qualitative change of an auditor's responsibility, which is from the limited liability to the unlimited liability. The other promotions are more like quantitative changes, instead of qualitative changes. Compared to the discrimination among other position promotions, the gender discrimination of female partner promotion can really represent the gender discrimination issue for female CPAs' promotion. Second, based on our search for the CICPA website, there is a significant amount of missing information for CPA positions and the information is not updated in time. Thus, we are unable to use such information to identify a CPA's position status, which makes it impossible to examine the promotion issues of other positions.

4. Empirical results

4.1. Descriptive statistics

All the continuous variables in our study are winsorised at the 1% and the 99% level to exclude the impacts of extreme values. Based on Table 1, the average value of *PARTNER* in the female candidate group is 0.071, while the average in the male candidate group is 0.123. On average, the likelihood of being partners is 7.1% for female CPAs and 12.3% for male CPAs. The promotion probability of female CPAs is 73.24% $((0.123 - 0.071)/0.071)$ lower than male CPAs. This indicates significant gender differences in the promotion process of CPAs.

Among the variables of the human capital characteristic, female candidates have less working experience (*WORK_YEAR*), younger ages (*AGE_YEAR*), higher education level (*EDUCATION*), better schools (*SCHOOL*), higher ratios of CPC members (*PARTY*) and accounting major (*MAJOR_ACCOUNTING*), and lower ratios of other business major (*MAJOR_MANAGEMENT*) and being a person in charge (*OFFICE_CHARGE*). Regarding the organisational characteristics, female candidates are more likely to work in a Big 4 firm (*BIG4*). For the behavioural characteristics, female candidates are less likely to move to a higher-level city (*FLOW_ON*). In terms of the economic contribution, female candidates have a smaller client size (*ACC_LNASSET*) than male candidates and have a lower ranking

Table 1. Descriptive statistics of CPA characteristic variables.

	Full sample		Female candidate subsample		Male candidate subsample		Mean difference
	Mean	Median	Mean	Median	Mean	Median	
<i>PARTNER</i>	0.103	0.000	0.071	0.000	0.123	0.000	−5.88***
<i>WORK_YEAR</i>	2.510	2.485	2.497	2.485	2.518	2.485	−2.28**
<i>AGE_YEAR</i>	3.754	3.738	3.748	3.738	3.758	3.761	−3.04**
<i>EDUCATION</i>	1.744	2.000	1.794	2.000	1.712	2.000	4.53***
<i>SCHOOL</i>	1.603	1.000	1.635	1.000	1.584	1.000	2.16**
<i>PARTY</i>	0.161	0.000	0.177	0.000	0.151	0.000	2.42***
<i>MAJOR_ACCOUNTING</i>	0.604	1.000	0.619	1.000	0.594	1.000	1.78*
<i>MAJOR_MANAGEMENT</i>	0.100	0.000	0.085	0.000	0.110	0.000	−2.82***
<i>MAJOR_ECONOMIC</i>	0.084	0.000	0.088	0.000	0.082	0.000	0.66
<i>OFFICE_CHARGE</i>	0.023	0.000	0.012	0.000	0.029	0.000	−3.85***
<i>BIG4</i>	0.066	0.000	0.099	0.000	0.045	0.000	7.55***
<i>FLOW_SO</i>	0.387	0.000	0.418	0.000	0.367	0.000	1.35
<i>FLOW_ON</i>	0.074	0.000	−0.093	0.000	0.180	0.000	−8.18***
<i>ACC_LNASSET</i>	185.600	112.500	151.100	100.700	207.600	129.600	−9.49***
<i>RANK</i>	0.230	0.000	0.184	0.000	0.260	0.040	−7.96***
<i>DA_AVERAGE</i>	0.065	0.052	0.063	0.050	0.066	0.053	−1.92**
<i>OPINION_RATIO</i>	0.021	0.000	0.024	0.000	0.020	0.000	2.19**

The sample in this table includes 4,844 CPA candidates who are signing auditors during the period of 2012 to 2018. The last column shows the t-tests of the mean difference between the female candidate subsample and the male candidate subsample.

in the audit report (*RANK*). For the audit quality measures, the clients' discretionary accruals (*DA_AVERAGE*) of female candidates are lower, and female CPAs are more likely to issue audit opinions that are not unqualified opinions (*OPINION_RATIO*).

Based on the above discussion, there is significant gender difference in CPA promotion. The gender differences also exist in their human capital, organisational and behavioural characteristics, economic contributions, and audit quality. Can the gender differences in these factors explain the gender difference in promotion? Is there any gender discrimination during the CPA promotion process? Further empirical analyses are needed.

4.2. Regression results

We conduct a correlation analysis for variables in Model 1 before our regression analysis. Table 2 provides the Pearson correlation of variables in Model 1. Table 2 shows a negative correlation between *GENDER* and *PARTNER*, which is significant at the 1% level. This indicates a significant gender difference in CPA promotion, where female CPAs have lower likelihood of being promoted as partners than male CPAs. *PARTNER* is also positively correlated with *EDUCATION*, *SCHOOL*, *MAJOR_ECONOMIC*, *OFFICE_CHARGE*, *BIG4*, *FLOW_ON*, *ACC_LNASSET*, and *RANK* at the 1% significant level, and with *WORK_YEAR* and *FLOW_SO* at the 5% level. In addition, *PARTNER* is negatively correlated with *MAJOR_ACCOUNTING* at the 1% level, and with *AGE_YEAR* at the 5% level. The correlation between our test variable and the control variables is lower. Neither is the correlation among the control variables. The highest correlation is between *WORK_YEAR* and *AGE_YEAR*, which is only 0.615. This indicates there is no multicollinearity issue in Model 1.

Table 3 shows the regression results of the CPA gender and the partner promotion. Due to the various missing information for the characteristic variables, we try alternative models to control for their impacts. Model 1–1 uses a sample of 21,046 partner candidates

Table 2. The correlation matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PARTNER	1								
GENDER	-0.084***	1							
WORK_YEAR	0.028**	-0.033**	1						
AGE_YEAR	-0.032**	-0.044***	0.615***	1					
EDUCATION	0.079***	0.065***	-0.031**	-0.058***	1				
SCHOOL	0.074***	0.031**	0.022	-0.107***	0.269***	1			
PARTY	0.018	0.035**	0.008	0.047***	0.177***	0.046***	1		
MAJOR_ACCOUNTING	-0.038***	0.026*	-0.048***	-0.135***	-0.036**	-0.065***	-0.016	1	
MAJOR_MANAGEMENT	0.002	-0.040***	-0.057***	0.069***	0.046***	0.007	0.065***	-0.412***	1
MAJOR_ECONOMIC	0.039***	0.009	-0.015	-0.037***	0.087***	0.057***	0.037**	-0.375***	-0.101***
OFFICE_CHARGE	0.068***	-0.055***	0.165***	0.155***	0.107***	-0.012	0.059***	-0.002	0.019
BIG4	0.086**	0.108***	-0.117***	-0.235***	0.205***	0.204***	0.094***	0.002	-0.017
FLOW_SO	0.041**	0.019	-0.240***	-0.135***	-0.066***	-0.149***	-0.011	-0.011	0.023
FLOW_ON	0.025**	-0.117***	0.207**	0.098***	-0.088**	-0.059***	-0.044***	-0.060***	-0.031**
ACC_LNASSET	0.069***	-0.135***	0.398***	0.312***	0.064***	0.047***	0.055***	-0.028*	-0.014
RANK	0.232***	-0.114***	0.342***	0.316***	0.076***	0.051***	0.087***	-0.049***	-0.010
DA_AVERAGE	0.040	-0.028*	0.001	0.010	-0.004	0.017	-0.011	-0.012	0.015
OPINION_RATIO	0.026	-0.031**	0.003	-0.018	0.012	0.007	-0.015	0.031**	-0.033**
Variable	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MAJOR_ECONOMIC	1								
OFFICE_CHARGE	0.004	1							
BIG4	0.093***	0.044***	1						
FLOW_SO	-0.017	-0.068***	0	1					
FLOW_ON	-0.010	-0.014	-0.033**	0.547***	1				
ACC_LNASSET	0.032**	0.106***	-0.140***	0.078***	-0.019	1			
RANK	0.014	0.228***	-0.099***	0.094***	-0.097***	0.343***	1		
DA_AVERAGE	0.036**	0.033**	0.010	0.017	0.008	0.055***	0.041***	1	
OPINION_RATIO	0.010	-0.017	0.005	0.065***	-0.061***	-0.003	0.005	0.200***	1

In this table presents the Pearson correlation coefficients of variables. The sample in this table includes 4,844 CPA candidates who are signing auditors during the period of 2012 to 2018. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively.

who can be signing auditors or non-signing auditors, while the sample in Model 1–2 only includes 4,844 partner candidates who are all signing auditors. The results of Model 1–1 and Model 1–2 in Table 3 show that the coefficient of *GENDER* is significantly smaller than zero at the 1% level. This indicates that even after controlling for the CPAs' human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, and audit quality, there is still significant gender difference in CPA promotion, which may be caused by the gender discrimination.

For the control variables, the results of Model 1–2 in Table 3 show that the coefficient of *WORK_YEAR* is significantly greater than 0 at the 5% level. This indicates that a longer working experience of a CPA can help to accumulate accounting and auditing expertise, which leads to a higher probability of getting promoted. The coefficient of *AGE_YEAR* is significantly smaller than 0 at the 1% level, which indicates CPAs with younger ages are more likely to be promoted, *ceteris paribus*. The coefficient of *EDUCATION* is significantly greater than 0 at the 5% level. A CPA with higher education level may have higher ability and is more likely to get promotion. The coefficient of *SCHOOL* is significantly greater than 0 at the 10% level, which indicates a better school of a CPA increases his/her promotion likelihood. The coefficient of *MAJOR_ACCOUNTING* is significantly smaller than 0 at the 5% level, which shows that the accounting background lowers a CPA's promotion likelihood. The coefficient of *OFFICE_CHARGE* is significantly greater than 0 at the 5% level. Compared to other CPAs, those who are also the person in charge of an audit office are more likely to be promoted as partners. *BIG4* also has a coefficient that is significantly larger than 0 at the 5% level. This indicates that CPA candidates in Big 4 have higher promotion probability. The coefficient of *FLOW_ON* is significantly greater than 0 at the 5% level, showing that if a CPA has moved to a higher-level city in his/her career, he/she is more likely to be promoted. The coefficients of *ACC_LNASSET* and *RANK* are both significantly greater than zero at the 1% level. Also, CPAs with more economic contribution to their firms have higher promotion probability. Although both the coefficients of *DA_AVERAGE* and *OPINION_RATIO* are positive, there are not statistically significant, which shows the audit quality of a CPA is not a major factor for partner promotion. In addition, we do not find significant impacts of other variables on partner promotion.

4.3. Difference analysis on promotion standards

The gender discrimination in the promotion of CPAs is mainly reflected in the difference in promotion standards. Following the decomposition method of Bauer and Sinning (2008), we further decompose the gender difference in promotion probability into two parts: the part that can be explained by observable variables such as the human capital characteristics, the organisational characteristics, the behavioural characteristics, the economic contribution, and the audit quality, and the unexplainable part, which is usually considered as gender discrimination. Specifically, we first use the subsample of male partner candidates to estimate the following Model 2 (the promotion model of male CPAs), where the estimated coefficients indicate the promotion standards for male CPAs. Then, we use the characteristic variables of female candidates in Model 2 to calculate the predicted promotion probability of female CPAs if they face the same promotion standards as male CPAs ($P_{\text{Femail_Predict}}$). Similarly, we use the subsample of female partner candidates to estimate the following Model 3 (the promotion model of female CPAs), where the

Table 3. The regression results of CPA gender and partner promotion.

Variable	Model 1–1	Model 1–2
<i>INTERCEPT</i>	0.505 (0.66)	−7.448*** (−3.46)
<i>GENDER</i>	−0.790*** (−10.64)	−0.518*** (−4.09)
<i>WORK_YEAR</i>	1.210*** (7.85)	0.587** (2.29)
<i>AGE_YEAR</i>	−1.992*** (−6.01)	−3.119*** (−4.92)
<i>EDUCATION</i>	0.198*** (3.30)	0.099** (2.06)
<i>SCHOOL</i>	0.146*** (3.40)	0.124* (1.74)
<i>PARTY</i>	0.126* (1.86)	−0.041 (−0.28)
<i>MAJOR_ACCOUNTING</i>	−0.110* (−1.75)	−0.306** (−2.21)
<i>MAJOR_MANAGEMENT</i>	0.056 (0.45)	0.040 (0.19)
<i>MAJOR_ECONOMIC</i>	−0.054 (−0.43)	0.110 (0.55)
<i>OFFICE_CHARGE</i>	2.007*** (11.37)	0.306** (1.98)
<i>BIG4</i>	0.919*** (4.19)	0.577** (2.28)
<i>FLOW_SO</i>	0.073** (2.21)	0.038 (0.70)
<i>FLOW_ON</i>	0.131*** (3.58)	0.045** (2.41)
<i>ACC_LNASSET</i>		0.001*** (3.18)
<i>RANK</i>		2.192*** (13.03)
<i>DA_AVERAGE</i>		1.566 (1.31)
<i>OPINION_RATIO</i>		1.024 (1.13)
<i>FE_{YEAR}</i>	Yes	Yes
<i>FE_{AUDIT_FIRM}</i>	Yes	Yes
<i>N</i>	21,046	4844
<i>Pseudo R²</i>	0.119	0.204

In this table, the dependent variable is *PARTNER*, which takes the value of one if a CPA candidate is promoted to become a partner in the year, and zero otherwise. The explanatory variable is *GENDER*, which equals to one if the CPA candidate is female, and zero otherwise. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

estimated coefficients indicate the promotion standards for female CPAs. Then, we use the characteristic variables of male candidates in Model 3 to calculate the predicted promotion probability of male CPAs if they face the same promotion standards as female CPAs ($P_{\text{Mail_Predict}}$). Following this method, we decompose the gender difference in promotion probability into two parts: the explainable part and the unexplainable part.

$$\begin{aligned}
PARTNER_{Male} = & \beta_0 + \beta_1 GENDER_{Male} + \beta_2 WORK_YEAR_{Male} + \beta_3 AGE_YEAR_{Male} \\
& + \beta_4 EDUCATION_{Male} + \beta_5 SCHOOL_{Male} + \beta_6 PARTY_{Male} + \beta_7 MAJOR_ACCOUNTING_{Male} \\
& + \beta_8 MAJOR_MANAGEMENT_{Male} + \beta_9 MAJOR_ECONOMIC_{Male} \\
& + \beta_{10} OFFICE_CHARGE_{Male} + \beta_{11} BIG4_{Male} + \beta_{12} FLOW_SO_{Male} + \beta_{13} FLOW_ON_{Male} \\
& + \beta_{14} ACC_LNASSET_{Male} + \beta_{15} RANK_{Male} + \beta_{16} DA_AVERAGE_{Male} \\
& + \beta_{17} OPINION_RATIO_{Male} + FE_{YEAR} + FE_{AUDIT_FIRM} + \varepsilon
\end{aligned}
\tag{2}$$

$$\begin{aligned}
PARTNER_{Female} = & \beta_0 + \beta_1 GENDER_{Female} + \beta_2 WORK_YEAR_{Female} + \beta_3 AGE_YEAR_{Female} \\
& + \beta_4 EDUCATION_{Female} + \beta_5 SCHOOL_{Female} + \beta_6 PARTY_{Female} \\
& + \beta_7 MAJOR_ACCOUNTING_{Female} + \beta_8 MAJOR_MANAGEMENT_{Female} \\
& + \beta_9 MAJOR_ECONOMIC_{Female} + \beta_{10} OFFICE_CHARGE_{Female} + \beta_{11} BIG4_{Female} \\
& + \beta_{12} FLOW_SO_{Female} + \beta_{13} FLOW_ON_{Female} + \beta_{14} ACC_LNASSET_{Female} \\
& + \beta_{15} RANK_{Female} + \beta_{16} DA_AVERAGE_{Female} + \beta_{17} OPINION_RATIO_{Female} + FE_{YEAR} \\
& + FE_{AUDIT_FIRM} + \varepsilon
\end{aligned}
\tag{3}$$

The decomposition results are provided in Table 4. The results show that when using the promotion model of male CPAs as the promotion standards, only 21.52% of the difference in promotion between female and male CPAs can be explained by the observable variables such as the human capital characteristics, the organisational characteristics, the behavioural characteristics, the economic contribution, and the audit quality; when using the promotion model of female CPAs as the standards, the explainable part can explain 24.38% of the gender difference in promotion. All these indicate higher promotion standards for female CPAs than male CPAs.

4.4. Robustness tests

4.4.1. Gender difference in audit quality

In the above analyses, we have controlled for the impacts of audit quality on the partner promotion. For the robustness tests, we develop Model 4 and Model 5 to further examine the audit quality differences between the female candidates and the male candidates in the year of promotion.

Table 4. The decomposition of gender difference in partner promotion.

	Female CPAs	Male CPAs
Actual promotion probability	0.0707	0.1232
Expected probability from the male CPA promotion model	0.1119	0.1232
Expected probability from the female CPA promotion model	0.0707	0.0835
The gender difference in the promotion probability	0.0525	
Explanatory part	0.0113	0.0128
The percentage of the explanatory part	21.52%	24.38%

In this table, we use the characteristic variables of the female (male) CPAs to estimate the female (male) CPA promotion model. Then, we use the male CPA promotion model to obtain the expected promotion probability of female CPAs and use the female CPA promotion model to obtain the expected promotion probability of male CPAs.

$$\begin{aligned}
 AB_ACCURAL = & \beta_0 + \beta_1 GENDER_ORDER / GENDER_DUMMY + \beta_2 LNASSET \\
 & + \beta_3 LEV + \beta_4 ROA + \beta_5 CURRENT + \beta_6 MB + \beta_7 CFO + \beta_8 STD_SALES \\
 & + \beta_9 STD_CFO + \beta_{10} STD_SALES_GRTH + \beta_{11} BIG4 + FE_{YEAR} \\
 & + FE_{INDUSTRY} + \varepsilon
 \end{aligned} \quad (4)$$

AB_ACCURAL is the dependent variable in Model 4, which is the discretionary accrual of a public client. A smaller value indicates higher audit quality. We also use the Modified Jones Model by industry and by year. The industry classification is based on the *Guidelines on Industry Classification of Listed Companies* issued by the CSRC in 2012. The Sub-category is used for the manufacturing industry, while the Category for other industries. *GENDER_ORDER* and *GENDER_DUMMY* are the test variables in Model 4. When exploring the relationship between gender and audit quality, instead of using an individual auditor's gender, we examine the gender of the signing auditor team and the audit quality. For each auditor team with two signing auditors, there could be three cases: female-female, female-male, and male-male. Based on this, we define *GENDER_ORDER* as a categorical variable, which takes the value of 2 when both signing auditors are female, 1 for the female-male case, and 0 for the male-male case. A higher value of *GENDER_ORDER* indicates a bigger role of female auditors. We also try an alternative sample by excluding cases with one male auditor and one female auditor. In this sample, we define the variable *GENDER_DUMMY*, which equals to one if both auditors of a public client are female, and zero if both are male. The sample in Model 4 is the clients audited by the 4,844 partner candidates from 2012 to 2018. However, for the female-male cases, to better understand the impacts of male candidates and female candidates, we exclude the observations where both CPAs are partner candidates. This leaves us a sample of 2,503 observations of public companies for Model 4–1. Then, we further delete all the male-female auditor case and obtain 1,454 observations as the sample of Model 4–2.

For the control variables, *LNASSET* is the natural logarithm of a client's yearend total assets; *LEV* is a client's debt ratio; *ROA* is the return on asset; *CURRENT* is a client's current ratio; *MB* represents the market-to-book ratio; *CFO* is the operating cash flows standardised by the total assets at the beginning of the year; *STD_SALES* is calculated as the standard deviation of the sales revenues in the prior 16 quarters; *STD_CFO* is calculated as the standard deviation of the operating cash flows in the prior 16 quarters; *STD_SALES_GRTH* is calculated as the standard deviation of the sales growth rates in the prior 16 quarters; *BIG4* is a dummy variable that equals to 1 if the client is audited by a Big 4 firm, and 0 otherwise. We further include *FE_{YEAR}* and *FE_{INDUSTRY}* to control for the impacts of the year and industry. Again, the industry classification is based on the *Guidelines on Industry Classification of Listed Companies* issued by the CSRC in 2012. The Sub-category is used for the manufacturing industry, while the Category for other industries.

$$\begin{aligned}
 OPIN_DUMMY = & \beta_0 + \beta_1 GENDER_ORDER / GENDER_DUMMY + \beta_2 LNASSET + \beta_3 LEV \\
 & + \beta_4 LOSS + \beta_5 CURRENT + \beta_6 ARINV + \beta_7 TURN + \beta_8 ROA + \beta_9 RET + \beta_{10} STDR \\
 & + \beta_{11} BIG4 + FE_{YEAR} + FE_{INDUSTRY} + \varepsilon
 \end{aligned} \quad (5)$$

The dependent variable in Model 5 is *OPIN_DUMMY*. It is a dummy variable that takes the value of one if the client didn't receive an unqualified audit opinion, and zero otherwise.

A greater value of *OPIN_DUMMY* indicates more severe audit opinion, which indicates higher audit quality.

The tests variables in Model 5 are *GENDER_ORDER* and *GENDER_DUMMY*, defined the same as in Model 4. The sample in Model 5 is also based on the clients audited by the 4,844 partner candidates during 2012 to 2018. Again, for the female-male cases, we exclude the observations where both CPAs are partner candidates. Then, we obtained 2,755 observations of public companies as the sample of Model 5–1, and 1,085 observations as the sample of Model 5–2 after further deleting all the male-female auditor case. For the control variables, *LNASSET*, *LEV*, *ROA*, *CURRENT*, *BIG4*, *FE_{YEAR_t}*, and *FE_{INDUSTRY}* are all defined the same as in Model 4. *LOSS* is a dummy variable that equals to one if the client company has losses in the year, and zero otherwise. *ARINV* is the ratio of the account receivables and inventory to total assets at the year end. *TURN* is the total assets turnover ratio. *RET* is the market-adjusted stock return, which signals information in the stock returns but not reflected by the earnings. *STDR* is the standard deviation of the residuals estimated by the market model, which is a measure for the non-systematic risks of listed companies. We use weekly data to perform regression analysis on the company's individual stock returns and the market returns to estimate the market model.

Table 5 shows the regression results of CPA gender and the clients' discretionary accruals in the promotion year. In Table 5, the coefficients of *GENDER_ORDER* and *GENDER_DUMMY* are significantly smaller than zero at the 5% and 10% level, respectively. This indicates that in the year of promotion, the clients audited by the female partner candidates have smaller discretionary accruals than the clients of the male candidates. Table 6 presents the regression results of CPA gender and the audit opinion in the promotion year. In Table 6, the coefficients of *GENDER_ORDER* and *GENDER_DUMMY* are significantly greater than zero at the 1% and 10% level, respectively. This indicates that compared to males, female candidates are more likely to issue severe audit opinions to their public clients. Based on the results in Tables 5 and 6, we find that the audit quality of female partner candidates is significantly higher than the audit quality of male candidates. Therefore, the gender difference in audit quality cannot explain the gender difference in promotion we document earlier. We also try an alternative sample using the year of the promotion and the prior two years as the sample period to re-examine the question and the results remain.

We further use a Heckman 2SLS model to address the endogeneity issue from the CPA gender. The endogeneity issue here refers to the self-selection between the auditor gender and the audit quality. For example, a better client company may tend to hire a female CPA as the auditor, and a female CPA tends to accept the audit work of a better client. We first address the endogeneity issue in the accruals model (Model 4). In the first stage of the 2SLS, we construct a model using the categorical gender variable (*GENDER_ORDER*) and a model using the dummy gender variable (*GENDER_DUMMY*), where both models include all the variables in Model 4 and one instrument variable. The instrument variable we used is the percentage of female signing auditors among all the signing auditors in a CPA firm (*FEMALE_RATIO*). A larger *FEMALE_RATIO* indicates a higher probability of having a female signing auditor in the audit report. The regression results of the two models in the first stage show that this instrument variable is significantly and positively related with *GENDER_ORDER* and *GENDER_DUMMY* at the 1% level. Also, it doesn't have significant correlation with the residual item in the accruals model.

Table 5. The regression results of CPA gender and clients' discretionary accruals.

Variable	Model 1–1	Model 1–2
<i>INTERCEPT</i>	–0.108** (–2.11)	–0.050 (–0.72)
<i>GENDER_ORDER</i>	–0.006** (–2.25)	
<i>GENDER_DUMMY</i>		–0.007* (–1.72)
<i>LNASSET</i>	–0.006** (2.55)	–0.003 (–1.07)
<i>LEV</i>	–0.007 (–0.55)	–0.005 (–0.25)
<i>ROA</i>	–0.921*** (–24.00)	–0.921*** (–17.26)
<i>CURRENT</i>	–0.002*** (2.70)	–0.003*** (–2.59)
<i>MB</i>	–0.001** (–2.57)	–0.001 (–1.63)
<i>CFO</i>	–0.574*** (–30.12)	–0.559*** (–21.17)
<i>STD_SALES</i>	0.000 (0.61)	0.000 (1.55)
<i>STD_CFO</i>	–0.000* (–1.89)	–0.000* (–1.93)
<i>STD_SALES_GRTH</i>	0.001*** (4.54)	0.001*** (3.32)
<i>BIG4</i>	–0.003 (–0.32)	–0.021 (–1.56)
<i>FE_{YEAR}</i>	Yes	Yes
<i>FE_{INDUSTRY}</i>	Yes	Yes
<i>N</i>	2503	1454
<i>R²</i>	0.458	0.456

In this table, *AB_ACCURAL* is the dependent variable. *GENDER_ORDER* and *GENDER_DUMMY* are the test variables. An OLS model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The t statistics are reported in parentheses.

Thus, it's reliable to use it in the Heckman 2SLS model. We further include the IMR (Inverse Mills Ratio) estimated from the first stage models into the second stage model. The results remain the same as our prior findings. Similar method is used for the audit opinion regression and the results still hold. Since the selection model may be affected by the multicollinearity issue, we also calculate the Variance Inflation Factor (VIF) of *GENDER_ORDER*, *GENDER_DUMMY*, and *IMR*. All their VIFs are lower than 10, indicating no multicollinearity issue in our selection model. Based on the above discussion, the selection models we construct are valid and they indicate the robustness of our empirical results. Since the coefficient of *IMR* is not statistically significant, there may not be an endogeneity issue from the CPA gender. Due the limited space, we did not tabulate the results of the endogeneity tests.

4.4.2. Gender difference in family burden

Is the gender difference in partner promotion caused by the gender difference in family burden? Compared to males, females may take more responsibility in their family, which reduces the time they can spend on working and leads to lower promotion probability. However, based on our prior analyses, we find that female candidates don't provide lower

Table 6. The regression results of CPA gender and audit opinion.

Variable	Model 5-1	Model 5-2
<i>INTERCEPT</i>	16.560*** (3.90)	6.833 (1.22)
<i>GENDER_ORDER</i>	0.799*** (2.61)	
<i>GENDER_DUMMY</i>		2.205* (1.90)
<i>LNASSET</i>	-0.992*** (-5.13)	-0.746*** (-2.94)
<i>LEV</i>	5.808*** (5.07)	6.579*** (3.86)
<i>LOSS</i>	0.922** (2.17)	0.791 (1.25)
<i>CURRENT</i>	0.058 (0.53)	0.208 (1.55)
<i>ARINV</i>	-2.500** (-2.01)	-0.915 (-0.57)
<i>TURN</i>	-0.899 (-1.53)	-1.053 (-1.33)
<i>ROA</i>	-13.280*** (-4.02)	-18.620*** (-3.50)
<i>RET</i>	-1.240* (-1.89)	-1.989** (-2.19)
<i>STDR</i>	19.70* (1.65)	18.760 (1.13)
<i>BIG4</i>	2.043 (1.12)	
<i>FE_{YEAR}</i>	YES	YES
<i>FE_{INDUSTRY}</i>	YES	YES
<i>N</i>	2775	1085
<i>R²</i>	0.459	0.550

In this table, *OPIN_DUMMY* is the dependent variable. *GENDER_ORDER* and *GENDER_DUMMY* are the test variables. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

quality audit. Instead, their audit quality is higher than that of male candidates. This shows that female candidates do not reduce their work efforts due to family burden. To further explore whether the gender difference in family burden causes the promotion difference, we examine the impacts of the 'Second Child' policy on the partner promotion.

In October 2015, the communique of the Fifth Plenary Session of the Central Committee at the 18th CPC National Congress stated to promote balanced population development, adhere to the basic national policy of family planning, improve the population development strategy, fully implement the policy that one couple can have two children, and actively deal with the ageing of the population. By searching the website of the National Bureau of Statistics, we find that the national birth rate was 12.07% in the prior year of the 'Second Child' policy (2015) and 12.43% in the year after the policy (2016), with a growth rate of 7.29%. The birth rate is increased due to such policy. If the gender difference in promotion is caused by the different family burden, we expect the promotion likelihood of female CPAs to decrease after the 'Second Child' policy. More specifically, we introduce an interaction term *GENDER*TWO_KIDS* as the test variable in Model 1. *GENDER* is a dummy variable that equals to 1 for female CPAs, and 0 otherwise. *TWO_KIDS* is a dummy variable that equals to 1 if the year is after the 'Second Child' policy, which is

Table 7. The regression results of ‘second child’ policy and partner promotion.

Variable	National		High growth area	
	Model 1–1	Model 1–2	Model 1–1	Model 1–2
<i>INTERCEPT</i>	2.113* (1.90)	−6.586*** (−3.13)	0.788 (0.31)	0.442 (0.11)
<i>GENDER</i>	−0.782*** (−5.92)	−0.409*** (−2.78)	−0.481*** (−2.85)	−0.029** (2.08)
<i>GENDER*TWO_KIDS</i>	−0.017 (−0.11)	−0.163 (−0.67)	−0.392 (−1.22)	−0.677 (−1.46)
<i>TWO_KIDS</i>	−0.800*** (−8.35)	−0.792*** (−5.71)	−0.773*** (−3.91)	−1.108*** (−3.92)
<i>WORK_YEAR</i>	1.132*** (7.43)	0.542** (2.15)	1.232*** (3.67)	0.038* (1.71)
<i>AGE_BEGIN</i>	−2.072*** (−6.26)	−3.210*** (−5.11)	−1.955*** (−2.59)	−1.327** (−2.04)
<i>EDUCATION</i>	0.194*** (3.21)	0.093** (1.99)	0.053** (2.40)	0.086* (1.88)
<i>SCHOOL</i>	0.147*** (3.44)	0.125* (1.77)	0.212** (2.29)	0.224 (1.57)
<i>PARTY</i>	0.122* (1.89)	−0.039 (−0.27)	0.257 (1.33)	0.255 (0.70)
<i>MAJOR_ACCOUNTING</i>	−0.125 (−1.45)	−0.329** (−2.38)	0.035 (0.19)	0.255 (0.91)
<i>MAJOR_MANAGEMENT</i>	0.035 (0.28)	0.01 (0.05)	−0.096 (−0.31)	0.41 (0.84)
<i>MAJOR_ECONOMIC</i>	−0.074 (−0.60)	0.073 (0.37)	−0.494 (−1.48)	0.181 (0.38)
<i>OFFICE_CHARGE</i>	2.004*** (11.40)	0.270** (1.96)	1.908*** (5.50)	0.801* (1.77)
<i>BIG4</i>	0.958*** (4.50)	0.588** (1.99)	1.502** (2.58)	0.122* (1.79)
<i>FLOW_SO</i>	0.063* (1.92)	0.052 (0.97)	0.119* (1.69)	0.126 (1.16)
<i>FLOW_ON</i>	0.132*** (3.64)	0.051** (2.36)	0.047** (2.42)	0.067** (2.11)
<i>ACC_LNASSET</i>		0.001*** (3.24)		0.000* (1.92)
<i>RANK</i>		2.185*** (13.07)		2.630*** (7.72)
<i>DA_AVERAGE</i>		1.854 (1.54)		−2.684 (−0.95)
<i>OPINION_RATIO</i>		0.895 (0.98)		0.594 (0.35)
<i>FE_{YEAR}</i>	Yes	Yes	Yes	Yes
<i>FE_{AUDIT_FIRM}</i>	Yes	Yes	Yes	Yes
<i>N</i>	21,046	4844	5396	1209
<i>Pseudo R²</i>	0.112	0.192	0.110	0.229

In this table, the dependent variable is *PARTNER*. The test variable is *GENDER*TWO_KIDS*. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

2016 and after, and 0 otherwise. Table 7 shows the impacts of the policy on female CPAs' promotion. We find that although the coefficient of *GENDER*TWO_KIDS* is negative, it's not statistically significant. This indicates that the policy has no significant impact on the female CPAs' promotion, which demonstrates that the gender difference in family burden is not a factor that causes the gender difference in promotion.

We also notice that the impacts of the ‘Second Child’ policy are significantly different in different locations and the birth rate in some locations still dropped in the third year after the policy. To improve the robustness of our results, we identify provinces with

significantly increased birth rates after the policy, where the average birth rate during the three years after the policy has increased by at least 5% compared to the average birth rate in the three years before the policy. Those provinces include Zhejiang, Fujian, Guangdong, Shandong, Jilin, Chongqing, Sichuan, Guizhou, and Shanxi. We restrict our sample to CPAs in these locations. We get 5,396 partner candidates, including both signing auditors and non-signing auditors, and 1,209 partner candidates, who are only signing auditors, in these locations during the period of 2012 to 2018. The results show that the promotion likelihood of female CPAs don't change significantly after the 'Second Child' policy.

4.4.3. Psychological differences of different gender

We further explore the psychological differences of different gender. The behavioural research states that, compared to males, females work harder, are more risk averse, and are more compliance with existing rules. For the difference in work effort, if female CPAs work harder than male CPAs, such psychological difference should add their promotion likelihood. Considering the impacts of this factor, there may be even more gender discrimination against women in CPA firms. Thus, the psychological difference in work effort doesn't affect our findings.

For the psychological difference in risk aversion, we investigate whether it causes the gender difference in promotion by using the situation where the partners share joint liabilities. On 19 August 2017, Shanghai DZH disclosed its 9th Civil Judgement Forms. Different from the prior eight forms, in the current one, the defendant Shanghai DZH was required to compensate the plaintiff, one natural person, with 52,927 RMB for investment losses and 118.81 RMB for commission losses within ten days of the effective date of the judgement. The defendant, Lixin CPA Firm, shall bear joint liabilities for the obligations of Shanghai DZH. This judgment on 19 August 2017 marks the first case where audit partners share joint liabilities, which signals increased legal risks of audit partners. Although it's not the final judgement, it could cause large psychological shock to the CPAs. If female auditors are more risk averse, we expect they are less willing to become partners after this case. Specifically, we add an interaction term, *GENDER*RISK*, in our promotion model. *RISK* is a dummy variable, which equals to one if an auditor becomes a partner in the year of 2018, and zero otherwise. Table 8 presents the empirical results. The coefficient of *GENDER*RISK* is positive but not statistically significant. We further exclude the observations in 2017 to reduce the noise in the data and the results remain. The analyses show that the psychological difference in risk aversion is not a major reason for the promotion difference.

For the psychological difference in rule compliance, we have already considered it in our model. If female CPAs are more compliance with rules than male CPAs, they may have higher audit quality, which can be reflected by less earnings management of female CPAs' clients and more severe audit opinion from female CPAs. We control both in our promotion model, where *DA_AVERAGE* is the mean of the absolute values of clients' discretionary accruals and *OPINION_RATIO* is one minus the percentage of unqualified opinions. In addition, if we use a sample of auditors who only issued unqualified audit opinions during the three years prior to the promotion, the results still hold. The psychological difference in rule compliance has no impact on our findings.

Table 8. The regression results of legal risks and partner promotion.

Variable	The whole sample		The sample without 2017 data	
	Model 1-1	Model 1-2	Model 1-1	Model 1-2
<i>INTERCEPT</i>	0.764 (0.66)	-7.350*** (-3.40)	-1.105 (-0.89)	-9.503*** (-3.88)
<i>GENDER</i>	-0.820*** (-10.12)	-0.542*** (-3.95)	-0.865*** (-9.31)	-0.556*** (-3.46)
<i>GENDER*RISK</i>	0.176 (0.94)	0.123 (0.42)	0.256 (1.32)	0.176 (0.56)
<i>RISK</i>	-0.327** (-2.41)	-0.143 (-0.75)	-0.564*** (-4.09)	-0.774*** (-3.66)
<i>WORK_YEAR</i>	1.211*** (7.86)	0.587** (2.29)	1.256*** (7.27)	0.651** (2.22)
<i>AGE_YEAR</i>	-1.988*** (-5.99)	-3.116*** (-4.91)	-1.523*** (-4.24)	-2.681*** (-3.74)
<i>EDUCATION</i>	0.198*** (3.29)	0.100 (1.06)	0.264*** (4.03)	0.193* (1.84)
<i>SCHOOL</i>	0.146*** (3.40)	0.124* (1.74)	0.143*** (3.00)	0.109 (1.36)
<i>PARTY</i>	0.125 (1.43)	-0.041 (-0.28)	0.086 (0.88)	-0.078 (-0.44)
<i>MAJOR_ACCOUNTING</i>	-0.110 (-1.28)	-0.308** (-2.22)	-0.076 (-0.81)	-0.351** (-2.31)
<i>MAJOR_MANAGEMENT</i>	0.055 (0.44)	0.037 (0.18)	0.016 (0.12)	-0.134 (-0.56)
<i>MAJOR_ECONOMIC</i>	-0.055 (-0.44)	0.108 (0.53)	-0.108 (-0.77)	-0.043 (-0.18)
<i>OFFICE_CHARGE</i>	2.008*** (11.36)	0.307 (1.00)	2.236*** (11.61)	0.563 (1.62)
<i>BIG4</i>	0.918*** (4.18)	0.572 (1.27)	0.917*** (3.71)	1.065** (2.57)
<i>FLOW_SO</i>	-0.074** (-2.21)	0.038 (0.70)	-0.091** (-2.49)	0.053 (0.86)
<i>FLOW_ON</i>	-0.130*** (-3.57)	0.046 (0.69)	-0.162*** (-4.01)	0.049 (0.65)
<i>ACC_LNASSET</i>		0.001*** (3.18)		0.001*** (3.03)
<i>RANK</i>		2.192*** (13.04)		2.357*** (12.87)
<i>DA_AVERAGE</i>		1.569 (1.31)		2.321* (1.70)
<i>OPINION_RATIO</i>		1.026 (1.13)		1.327 (1.31)
<i>N</i>	21,046	4844	16,696	3738
<i>Pseudo R²</i>	0.119	0.204	0.134	0.238

In this table, the dependent variable is *PARTNER*. The test variable is *GENDER*RISK*. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

4.4.4. Other possible explanations

In China, there is a differential retirement policy, where women can retire at a younger age than men. Such retirement policy could shorten the career length of female workers. It could be a potential factor that causes the promotion difference between men and women. However, this may not be the case for the CPA industry. According to *The Measures for the Registration of Certified Public Accountants* issued on 1 March 2005, both male and female CPAs can continue their practice till 70 years old. Therefore, the CPAs' promotion shall not be impacted by the differential retirement policy.

Some psychological studies argue that men and women have different preferences in competition. In other words, women may be more 'shamed' to compete, and such preference affects their career choices and job performance, which further impacts their promotions. However, the preference difference in competition cannot explain the gender difference in promotion. Both female and male CPAs are already in the CPA profession so that there is no need to choose a career. The CPA profession itself is a high-intensity and highly competitive profession. If female CPAs are 'shamed' to compete, they may not enter such profession.

5. Further discussion

A key issue to examine the gender discrimination during partner promotion is to identify CPAs who are qualified for the promotion, which are also called the partner candidates. In the prior analyses, we use 8 years after getting the CPA licence as our benchmark to identify senior managers who are considered as partner candidates. Although it works to some extent, there may be noises that impact the accuracy of our empirical results. Therefore, we use the PSM method to calculate the promotion probability for each CPA. Then, we match a CPA who got promoted with one who didn't and re-examine the gender discrimination issue.

Specifically, we search all CPA firms with partner promotions from 2011 to 2018 and find 31,718 CPAs with available individual information. Those CPAs include 1,109 partners and 30,609 non-partners. We estimate the following Logit model using this sample to obtain the propensity score of each CPA. Then, we match a CPA who got promoted with those who didn't get promoted based on their propensity scores. A 1:5 match is used and the matched sample has 6,399 observations, including 1,084 CPAs who got promoted and 5,315 CPAs who didn't.

$$\begin{aligned} PARTNER = & \beta_0 + \beta_1 WORK_YEAR + \beta_2 AGE_YEAR + \beta_3 EDUCATION + \beta_4 SCHOOL \\ & + \beta_5 PARTY + \beta_6 MAJOR_ACCOUNTING + \beta_7 MAJOR_MANAGEMENT \\ & + \beta_8 MAJOR_ECONOMIC + \beta_9 OFFICE_CHARGE + \beta_{10} BIG4 \\ & + \beta_{11} FLOW_SO + \beta_{12} FLOW_ON + \varepsilon \end{aligned} \quad (6)$$

Based on the 31,718 CPAs with available individual information, we identify 6,389 CPAs who audit A-share list companies and with available auditing information., including 552 partners and 5,837 non-partners. Using this sample, we estimate the following Logit model to get the propensity scores of each CPA. Then, we match a CPA who got promoted with those who didn't get promoted based on their propensity scores. Again, we use a 1:5 match to get a matched sample of 2,943 CPAs, including 526 partners and 2,417 non-partners.

$$\begin{aligned} PARTNER = & \beta_0 + \beta_1 WORK_YEAR + \beta_2 AGE_YEAR + \beta_3 EDUCATION + \beta_4 SCHOOL \\ & + \beta_5 PARTY + \beta_6 MAJOR_ACCOUNTING + \beta_7 MAJOR_MANAGEMENT \\ & + \beta_8 MAJOR_ECONOMIC + \beta_9 OFFICE_CHARGE + \beta_{10} BIG4 \\ & + \beta_{11} FLOW_SO + \beta_{12} FLOW_ON + \beta_{13} ACC_LNASSET + \beta_{14} RANK \\ & + \beta_{15} DA_AVERAGE + \beta_{16} OPINION_RATIO + \varepsilon \end{aligned} \quad (7)$$

Table 9. The matched sample (1:5) regression results of CPA gender and partner promotion.

Variable	Model 1–1 Coefficient	Model 1–2 Coefficient
<i>INTERCEPT</i>	–1.156 (–1.05)	–0.781 (–0.45)
<i>GENDER</i>	–0.832*** (–11.42)	–0.537*** (–4.81)
<i>WORK_YEAR</i>	–0.071 (–0.65)	0.089 (0.54)
<i>AGE_YEAR</i>	–0.004 (–0.01)	–0.250 (–0.49)
<i>EDUCATION</i>	0.046 (0.78)	0.061 (0.70)
<i>SCHOOL</i>	–0.023 (–0.52)	–0.026 (–0.40)
<i>PARTY</i>	0.024 (0.29)	–0.001 (0.00)
<i>MAJOR_ACCOUNTING</i>	0.055 (0.63)	–0.004 (–0.03)
<i>MAJOR_MANAGEMENT</i>	–0.011 (–0.09)	–0.049 (–0.26)
<i>MAJOR_ECONOMIC</i>	–0.002 (–0.02)	0.009 (0.05)
<i>OFFICE_CHARGE</i>	0.380* (1.93)	0.085 (0.31)
<i>BIG4</i>	0.060 (0.56)	0.065 (0.40)
<i>FLOW_SO</i>	–0.016 (–0.49)	0.024 (0.50)
<i>FLOW_ON</i>	0.007 (0.20)	–0.009 (–0.15)
<i>ACC_LNASSET</i>		–0.000 (–1.14)
<i>RANK</i>		0.124 (0.86)
<i>DA_AVERAGE</i>		1.497 (1.37)
<i>OPINION_RATIO</i>		–0.787 (–0.99)
<i>N</i>	6399	2943
<i>Pseudo R²</i>	0.026	0.011

In this table, the dependent variable is *PARTNER*. The test variable is *GENDER*. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

We re-examine the gender discrimination issue during the partner promotion process using the above two matched samples. Table 9 presents the regression results. The results of Model 1–1 and Model 1–2 in Table 9 show that the coefficients of *GENDER* are negative and significant at the 1% level. This further confirms that there is still significant gender difference in CPA promotion after controlling the human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, and audit quality, which indicates gender discrimination.

Table 10 shows the regression results of the ‘Second Child’ policy and the partner promotion. By using the national data, the coefficient of *GENDER* TWO_KIDS* is positive in Model 1–1, but negative in Model 1–2. However, neither coefficient is statistically significant. By using the data of provinces with high birth increases, both coefficients of

Table 10. The matched sample (1:5) regression results of ‘second child’ policy and partner promotion.

Variable	National		High growth area	
	Model 1–1	Model 1–2	Model 1–1	Model 1–2
<i>INTERCEPT</i>	–1.152 (–1.05)	–1.058 (–0.61)	–0.572 (–0.24)	–6.277* (–1.92)
<i>GENDER</i>	–0.848*** (–7.95)	–0.425** (–2.43)	–0.583** (–2.50)	–0.044 (–0.12)
<i>GENDER*TWO_KIDS</i>	0.0295 (0.21)	–0.173 (–0.78)	–0.293 (–0.93)	–0.520 (–1.16)
<i>TWO_KIDS</i>	–0.010 (–0.12)	–0.114 (–0.95)	0.056 (0.31)	–0.294 (–1.18)
<i>WORK_YEAR</i>	–0.071 (–0.65)	0.100 (0.60)	–0.078 (–0.28)	–0.323 (–0.95)
<i>AGE_YEAR</i>	–0.004 (–0.01)	–0.161 (–0.31)	–0.127 (–0.18)	1.462 (1.48)
<i>EDUCATION</i>	0.046 (0.77)	0.058 (0.66)	–0.125 (–0.99)	–0.114 (–0.66)
<i>SCHOOL</i>	–0.023 (–0.52)	–0.034 (–0.53)	0.0216 (0.24)	0.052 (0.41)
<i>PARTY</i>	0.024 (0.29)	–0.000 (0.00)	0.226 (1.21)	0.050 (0.18)
<i>MAJOR_ACCOUNTING</i>	0.055 (0.63)	0.033 (0.26)	0.081 (0.45)	0.768*** (2.99)
<i>MAJOR_MANAGEMENT</i>	–0.011 (–0.09)	–0.030 (–0.15)	–0.270 (–0.89)	0.038 (0.09)
<i>MAJOR_ECONOMIC</i>	–0.002 (–0.02)	0.035 (0.19)	–0.501* (–1.65)	0.029 (0.07)
<i>OFFICE_CHARGE</i>	0.379* (1.91)	0.024 (0.09)	0.485 (1.27)	0.461 (0.87)
<i>BIG4</i>	0.059 (0.55)	0.081 (0.50)	–0.327 (–0.92)	0.076 (0.16)
<i>FLOW_SO</i>	–0.016 (–0.49)	0.025 (0.53)	–0.040 (–0.58)	–0.057 (–0.64)
<i>FLOW_ON</i>	0.007 (0.19)	0.001 (0.02)	0.062 (0.66)	–0.161 (–1.17)
<i>ACC_LNASSET</i>		–0.000 (–1.24)		–0.001** (–2.17)
<i>RANK</i>		0.102 (0.71)		0.461 (1.59)
<i>DA_AVERAGE</i>		1.449 (1.33)		1.986 (0.83)
<i>OPINION_RATIO</i>		–0.751 (–0.95)		–0.270 (–0.17)
<i>N</i>	6399	2943	1014	552
<i>Pseudo R²</i>	0.026	0.012	0.030	0.045

In this table, the dependent variable is *PARTNER*. The test variable is *GENDER*TWO_KIDS*. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

*GENDER*TWO_KIDS* are negative and insignificant. The results confirm that the ‘Second Child’ policy doesn’t affect female CPAs’ promotion and the gender difference in family burden is not a reason for the gender difference in promotion.

The regression results of the legal risks and the partner promotion are provided in Table 11. The results of Model 1–1 and Model 1–2 using the whole sample show that the coefficients of *GENDER*RISK* are positive, but not statistically significant. To avoid the noise in the 2017 data, we exclude those observations and the results still hold. All these indicate the psychological difference in risk aversion does not affect female CPAs’

Table 11. The matched sample (1:5) regression results of legal risks and partner promotion.

Variable	The whole sample		The sample without 2017 data	
	Model 1–2	Model 1–1	Model 1–2	Model 1–1
<i>INTERCEPT</i>	–1.162 (–1.05)	–0.902 (–0.52)	–0.753 (–0.63)	–0.967 (–0.51)
<i>GENDER</i>	–0.842*** (–10.56)	–0.536*** (–4.28)	–0.870*** (–9.71)	–0.577*** (–4.03)
<i>GENDER*RISK</i>	0.057 (0.30)	0.003 (0.01)	0.090 (0.47)	0.040 (0.14)
<i>RISK</i>	–0.025 (–0.22)	–0.103 (–0.68)	–0.025 (–0.21)	–0.137 (–0.88)
<i>WORK_YEAR</i>	–0.071 (–0.65)	0.094 (0.57)	–0.073 (–0.62)	0.058 (0.32)
<i>AGE_YEAR</i>	–0.001 (–0.00)	–0.214 (–0.42)	–0.111 (–0.32)	–0.156 (–0.28)
<i>EDUCATION</i>	0.045 (0.76)	0.062 (0.72)	0.046 (0.72)	0.015 (0.16)
<i>SCHOOL</i>	–0.023 (–0.52)	–0.029 (–0.45)	–0.006 (–0.13)	0.005 (0.07)
<i>PARTY</i>	0.024 (0.28)	–0.002 (–0.02)	0.020 (0.22)	0.045 (0.32)
<i>MAJOR_ACCOUNTING</i>	0.055 (0.63)	0.006 (0.05)	0.037 (0.38)	0.027 (0.20)
<i>MAJOR_MANAGEMENT</i>	–0.011 (–0.09)	–0.043 (–0.22)	0.002 (0.01)	–0.064 (–0.30)
<i>MAJOR_ECONOMIC</i>	–0.002 (–0.02)	0.011 (0.06)	–0.009 (–0.07)	0.117 (0.58)
<i>OFFICE_CHARGE</i>	0.380* (1.93)	0.074 (0.27)	0.396** (1.97)	0.091 (0.33)
<i>BIG4</i>	0.059 (0.55)	0.059 (0.37)	0.006 (0.05)	0.017 (0.09)
<i>FLOW_SO</i>	–0.016 (–0.50)	0.024 (0.50)	–0.012 (–0.33)	0.012 (0.23)
<i>FLOW_ON</i>	0.008 (0.20)	–0.005 (–0.09)	0.003 (0.09)	–0.006 (–0.09)
<i>ACC_LNASSET</i>		–0.000 (–1.25)		–0.000 (–1.23)
<i>RANK</i>		0.128 (0.90)		0.115 (0.73)
<i>DA_AVERAGE</i>		1.471 (1.35)		1.201 (1.01)
<i>OPINION_RATIO</i>		–0.781 (–0.99)		–0.882 (–1.03)
<i>N</i>	6399	2943	5343	2409
<i>Pseudo R²</i>	0.026	0.011	0.027	0.012

In this table, the dependent variable is *PARTNER*. The test variable is *GENDER*RISK*. A LOGIT model is used in this table. ***, **, * Denote the two-tailed statistical significance at the 1%, 5%, and 10% level, respectively. The z statistics are reported in parentheses.

promotion. In other words, the psychological difference in risk aversion has no effect on our findings.

To further improve the robustness of our results, we try alternative matched samples by using 1:3, 1:1 matching. The results remain. The results are not tabulated due to limited space. Overall, our results are robust and reliable. Please note that since we include the human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, and audit quality in the model when calculating the propensity scores, these variables are no longer significant in Model 1.

6. Conclusion

In this paper, we examine the determinants of partner promotion of CPAs and the gender discrimination issue during promotion, using a sample of 4,844 partner candidates from 2012 to 2018. We find that a CPA is more likely to be promoted to be a partner when he/she has longer working experience, a younger age, a higher education level, a better graduation school, and a non-accounting major, is the person in charge in an audit office, works in a Big 4 firm, has moved to a higher-level city, and has more economic contribution to the CPA firm. However, the CPC membership, other business or economic major, the flow from the school to the initial workplace, and the audit quality are not significant determinants for partner promotion. There is still significant gender difference in the CPA promotion after controlling for the human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, and audit quality. In addition, we document higher promotion standards for female CPAs than male CPAs. We further compare the audit quality between the female partner candidates and the male partner candidates in the promotion year and find higher audit quality from female candidates. Moreover, we match CPAs who got promoted with CPAs who didn't by using the PSM method. Results from the matched samples also indicate lower promotion likelihood for female CPAs. All the above results demonstrate that the gender difference in CPA promotion cannot be explained by the human capital characteristics, organisational characteristics, behavioural characteristics, economic contribution, audit quality, or other possible explanatory factors, such as family burden, the differential retirement policy, and the different preference in competition. Therefore, we can conclude that the gender discrimination is the major factor that causes such promotion difference between male and female CPAs.

This paper contributes to the literature from two aspects. First, we examine the influential factors for CPA promotion and further investigate the gender discrimination issue during the promotion process. This fills the lack of studies on CPA promotion mechanism. The promotion mechanism is vital for the development of the CPA industry. However, there is little research in the current literature. Only a few studies conduct theoretical discussions, but there is no empirical test on the determinants of CPA promotion and the possible gender discrimination during the process. Second, we document empirical evidence on the gender discrimination during the CPA promotion and provide new directions for the research on the gender difference in auditor behaviour. We explore the gender difference in psychological characteristics. Our findings show that the gender difference in CPA behaviour may not be caused by their psychological differences. Instead, it could be caused by the gender difference in promotion. For example, the gender discrimination of CPA promotion places higher promotion standards for female signing auditors, which leads to higher audit quality than male auditors.

From the practical perspective, this paper proves the gender discrimination in CPA promotion, which points out a new focus for the regulators of the CPA industry. Compared to the direct salary discrimination in a position, it's harder to notice the promotion discrimination between female and male CPAs. Therefore, the gender equality or anti-discrimination policy of the CPA labour market should not only focus on the equality at the entry level, but also on the gender equality in the promotion of CPA positions. In addition, to alleviate gender discrimination in

promotion, the regulators and the CPA firms should more actively provide trainings and continue study opportunities for female CPAs, as well as create conditions for their reasonable job mobility.

This paper has a few limitations. First, like other empirical research on gender discrimination, we are unable to identify the resources of gender discrimination in promotion, which may require further analyses. Second, due to the missing information of CPAs' characteristic variables, we have to delete a large portion of CPA observations and this may affect our empirical results. In addition, we didn't further discuss the promotion of managing partners. The major reason is that it may not be the appropriate time for such research. The CPA firm transformation process started in 2011 and lasted till 2013 when all the firms with security qualifications fulfilled their organisation changes to the special general partnerships. Due to the short transition time, the current managing partners are mainly those who were shareholders of the firms before the transition. We don't have the necessary conditions to examine the promotion of managing partners. As time goes on, the first group of truly selected partners (not the shareholders before the transformation) will grow and be promoted from general partners to managing partners. Then, it may be a good time to examine the promotion of managing partners. Moreover, based on the current information, we cannot get the time when an auditor became a managing partner, which constrains our further research. Finally, there is limited information on a CPA's schools and degrees, which doesn't provide his/her detailed education experience. The education experience at or after college degrees is rare and there is usually only one school and one degree. Since such information is publicly disclosed on the CICPA website, we tend to use it as the highest degree and the related school of an auditor. Due to the limitation of the school and degree information, we cannot control for the impacts of different degree and school levels on partner promotion. These are the limitations in our control variables.

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